UNITED STATES PATENT OFFICE.

H. JULIUS SMITH, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ELECTRIC FUSES.

Specification forming part of Letters Patent No. **79,268**, dated June 23, 1868.

To all whom it may concern:

Be it known that I, H. JULIUS SMITH, of Boston, Suffolk county, State of Massachusetts, have invented certain new and useful Improvements in Electrical Fuses or Exploders; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvements without further invention or experiment.

This invention consists in improvements in the mode of manufacturing electric fuses, by which they are rendered less costly in construction, more certain of operation, and more convenient in use.

These improvements are in details of construction and arrangement, involving no discovery in electrical science, but a novel application and combination of what is known, so as to produce a new effect, or an old effect in a better manner.

The only electric fuse which resembles mine, and the only one that has been much known or used, is the English fuse; but it is liable to such serious objections that it still remains a desideratum to obtain a fuse that shall avoid its defects. The English fuse has two wires separately insulated, and these are not continued into the cap containing the fulminate, but have to be soldered to wires which proceed from that cap. The salt used as a flux in soldering is apt to attract moisture, and the least introduction of moisture breaks the insulation and destroys the operation of the fuse. It frequently happens, moreover, that the two wires become crossed, and, in tamping, the insulating material is cut away, and the wires so exposed as to destroy the insulation. From the operation of these causes a large percentage of these fuses fail in practice, and as their cost is high they are not more economical than reliable. The necessity for soldering, of course, renders them inconvenient to use, even if they were subject to no more serious objection.

It has been my aim in these improvements to remedy these defects, which I do by the use of two wires inclosed in the same insulator, and by carrying the ends of the wires thus inclosed directly into the cap containing the fulminate, thus avoiding the soldering process, so inconvenient and so dangerous to the certainty of operation of the fuse. Fuses made in this way have proved in practice to be convenient, certain in firing, not liable to injury in tamping, and in cost not more than a third that of the English fuse.

To enable others to make use of my improvements, I will proceed to describe the construction and operation of my improved fuse, referring to the drawings, whereon—

A A indicate the two wires inclosed in a common insulating-coating, B. This coating forms a cylindrical cord, which is passed directly into the cap C, containing the fulminate or explosive compound D, surrounding the ends of the wires A A.

An outer cylinder, F, of wood, is passed over the metallic cap C, and is charged with gunpowder E. The ends of cylinder F are closed with a water-proof cement, and its surface is covered with grease to protect it from the action of water. The cap C, I make of copper, it being struck up from a single piece of that metal.

The fuse is fired by passing a current of electricity through the wires A A. The interruption of the current, where the wires are separated in the cap C, develops heat, which ignites the fulminate and explodes the charge.

Having thus fully described my invention, I do not claim any of the parts separately.

I am aware that it is usual for telegraphic purposes to inclose two or more wires in a common coating; and I am aware that metallic caps have been struck up from a single piece of metal, and that fuses have been fired by electricity. These, therefore, I do not claim; but

What I do claim, and desire to secure by Letters Patent, is—

An electric fuse in which the end of a single insulating-cord containing two insulated wires is introduced directly into the cap containing the fulminate to be fired, in the manner described.

H. JULIUS SMITH.

Witnesses:

J. DENNIS, Jr.,

WM. DENNIS.